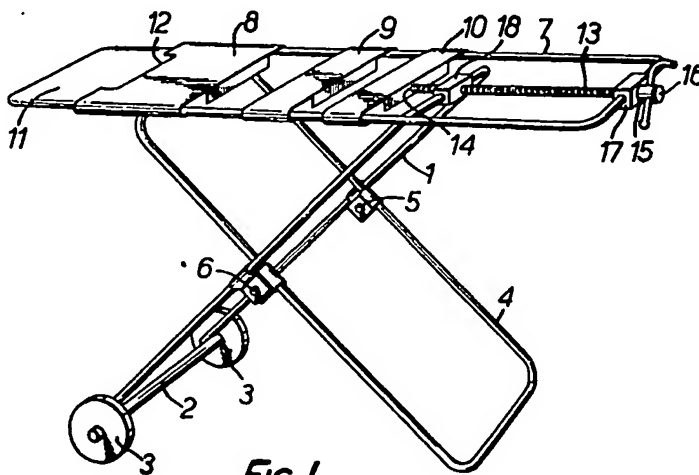


# (12) UK Patent Application (19) GB (11) 2 051 690 A

- (21) Application No 8014013  
(22) Date of filing  
29 Apr 1980  
(30) Priority data  
(31) 7916922  
(32) 15 May 1979  
(33) United Kingdom (GB)  
(43) Application published  
21 Jan 1981  
(51) INT CL<sup>3</sup> B62B 1/20  
(52) Domestic classification  
B7B 365 TL2  
(56) Documents cited  
GB 1375755  
GB 1300368  
GB 1037512  
(58) Field of search  
B7B  
B8L  
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## (54) Dual-purpose wheeled trolley/work surface

(57) A mechanical handling device for transporting an article, for example, from a vehicle into a building and for elevating the article when at its destination to facilitate unloading. The device includes a platform (7, 8, 9, 10) which is raised or lowered by rotation of a threaded shaft (13) providing a mechanical advantage to enable heavy loads to be elevated. In addition to supporting the article, the platform (7, 8, 9, 10) can be used as a working surface and in this case it has the additional advantage that the surface can be positioned at a desired height. Brakes and/or ratchets acting on the wheels (3) improve handling of the device when negotiating slopes or stairs.



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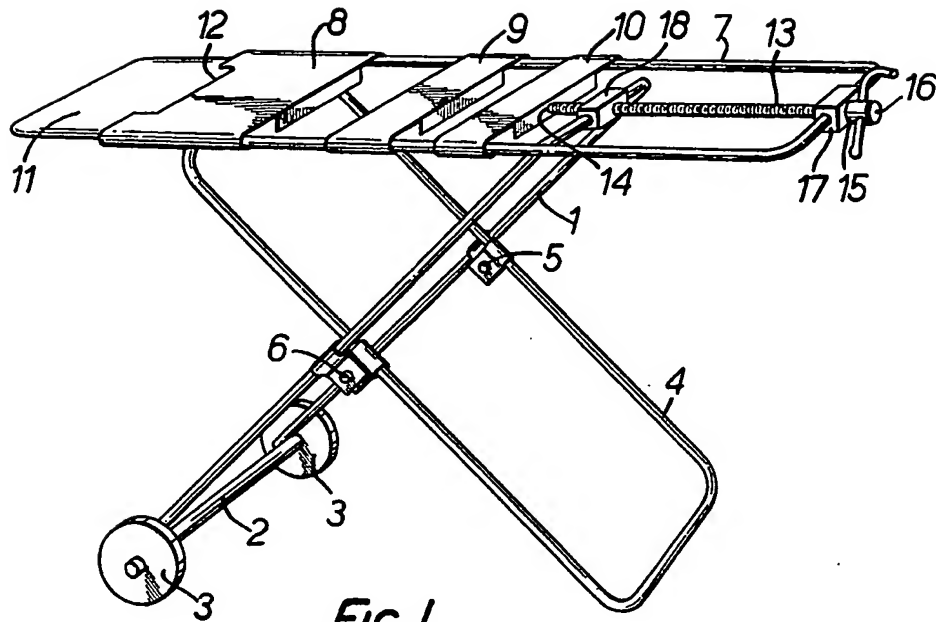


FIG. 1.

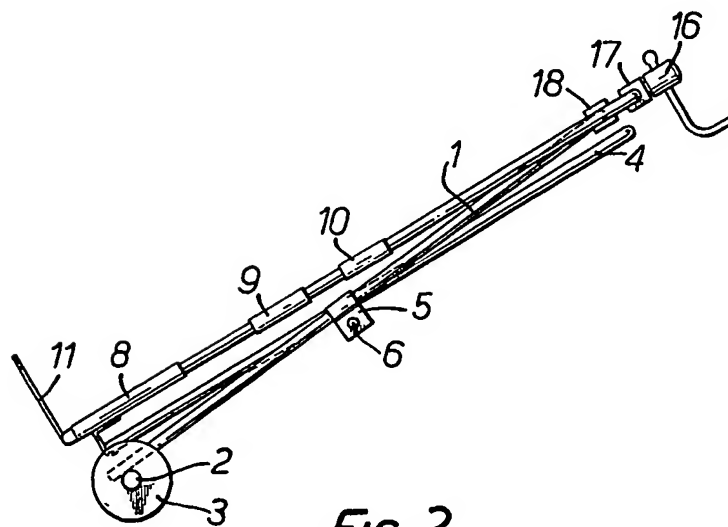


FIG. 2.

## SPECIFICATION

### Improvements in or relating to mechanical handling devices

5

The present invention relates to mechanical handling devices and in particular to devices for transporting and elevating articles.

Dual purpose devices have previously been proposed in which a wheeled trolley can be converted to provide a demonstration bench or similar horizontal working surface. Such devices usually include a platform and a collapsible wheeled frame which is lockable either in a collapsed position to provide a trolley or in an extended position in which the platform is raised to provide a horizontal surface.

According to the present invention a mechanical handling device includes a pair of frame members pivotally interconnected to form a scissors-like configuration; a pair of wheels attached to one of the frame members; and a platform hinged to one frame member and secured by an adjustable connection to the other frame member, operation of the adjustable connection pivoting the frames relative to one another to vary the height of the platform, the arrangement being such that when the platform is fully lowered the device forms a trolley for transporting an article and as the platform is raised the article is elevated to a desired height.

It is envisaged that the platform may also be used as a working surface.

The adjustable connection may be provided by a threaded shaft rotatably mounted in the platform and engaging a corresponding threaded member secured to said other frame member.

A hinged extension to the platform may be provided which also serves to retain the article when the device is in its trolley mode.

Brakes and/or ratchets may be provided on the wheels to improve handling of the device in its trolley mode.

Apparatus embodying the present invention will now be described, by way of example, with reference to the accompanying drawing, in which,

*Figure 1* is a perspective view of a transport and elevating device in an elevated mode, and

*Figure 2* is a side view of the device in a transport mode.

Referring now to the drawing, a frame member 1 is formed, preferably from tubular material, into a configuration such that resembles three sides of a rectangle. An axle 2 is secured across the open end of the frame member 1 and a pair of wheels 3 are rotatably attached one to either end of the axle 2. A further frame member 4, which is constructed from similar tubular material to that of the frame 1 is formed into a rectangular configuration and is dimensioned such that it fits freely within the frame 1. Lugs 5 are provided

on both frames 1 and 4 and pivot pins 6 passing through the lugs 5 allow the frames 1 and 4 to pivot relative to one another. The lugs 5 may be omitted if desired and the pivot pins passed directly through the frame members 1 and 4.

A platform is provided by a further tubular frame 7 and surfaces 8, 9 and 10 extending across the frame 7. The surfaces 8, 9 and 10 are formed from sheet material and are dimensioned and positioned so as to provide adequate support for the articles or equipment to be transported. Instead of the three separate surfaces 8, 9 and 10 the platform could of course comprise a single larger surface. An extension 11 is connected by a hinge 12 to the platform. Means (not shown) are provided to lock the extension 11 either in a position in which it lies in the same plane as the platform to form the extension thereto or in a position in which it projects at a predetermined angle, for example, 90° from the surface of the platform. Such means may comprise, for example, a stop on the hinge 12 to prevent further rotation of the extension 11 past the point at which it lies in the same plane as the platform and a simple strut arrangement to retain the extension 11 in its angular position.

The frame member 4 is hinged to the underside of the surface 8 of the platform and the frame member 1 is connected to the platform by a variable screw link device. The screw link device comprises a threaded shaft 13 which is mounted for rotation in the platform at points 14 and 15. An operating handle 16 is provided on one end of the shaft 13 which is rotatable in conventional plain bearings, one of which is provided by a block 17 in the frame 7, through which the shaft 13 passes. A similar bearing (not shown) is provided beneath the surface 10 and axial movement of the shaft 13 is prevented by engagement of the handle 16 with the block 17 and engagement of a collar (not shown) on the other end of the shaft 13 with the other bearing. The threaded shaft 13 engages a threaded block 18 provided in the frame 1.

In operation of the device, rotation of the shaft 13 causes the block 18 to move along the shaft to rotate the frames 1 and 4 about the pivot pins 6 and thereby raise or lower the platform. The various parts of the device are positioned relative to one another so that when the platform is raised or lowered it always remains substantially horizontally disposed.

Fig. 2 shows the device with the platform fully lowered, in which state the device forms a trolley suitable for the transportation of articles such as items of equipment, for example. The extension 11 to the platform is at this time locked in the previously mentioned angular position to retain the transported article in position on the platform. The device in this state is such that it can easily be carried

in a van or in the boot of a car, for example, and thus is eminently suitable for transporting an article from such a vehicle into a factory, office or other premises.

5 After the transported article has been conveyed to its destination the device may be laid flat and elevated by rotation of the handle 16 to any height which is required, for example, to facilitate unloading. A mechanical advantage, which is dependent upon the thread chosen for the screw link, is provided by the device to thereby make the elevation of heavy articles relatively easy. It has been found that a mechanical advantage of 20:1 provides  
10 easy elevation of loads up to 112lbs. In the elevated position the device also provides a useful working surface the area of which may be increased by the extension 11.

Further refinements may be provided to the  
20 basic device such as, for example, brakes (not shown) operable on the wheels. Such brakes could be utilised when the device was being used as a trolley and would be applied by the trolley handler to improve handling of the  
25 trolley when negotiating slopes or staircases, for example. The brakes could also be used while the device was being elevated or used as a working surface to prevent unwanted movement of the device. Ratchet devices (not  
30 shown) may also be provided on the wheels for a similar purpose. Such ratchet devices may be provided instead of, or in addition to, the brakes.

The described device has been constructed  
35 to handle articles weighing in the order of 112lbs. In this arrangement the weight of the elevated article is taken by the lead screw 13 and, therefore, if an article of excessive weight is handled, bending of the lead screw  
40 could occur. It will be realised, however, that it is simple matter to transfer the applied weight of the article from the lead screw to the frame 7. For example, the horizontal upper part of the frame member 1 may be  
45 extended to engage the underside of the frame 7 or the threaded block 18 itself may be extended and provided with apertures in its ends which slidably engage with the frame 7. In the latter case the threaded block 18 could  
50 also form the horizontal upper part of the frame 1.

#### CLAIMS

1. A mechanical handling device including  
55 a pair of frame members pivotally interconnected to form a scissors-like configuration; a pair of wheels attached to one of the frame members; and a platform hinged to one frame member and secured by an adjustable connection to the other frame member, operation of  
60 the adjustable connection pivoting the frames relative to one another to vary the height of the platform, the arrangement being such that when the platform is fully lowered the device  
65 forms a trolley for transporting an article and

as the platform is raised the article is elevated to a desired height.

2. A device as claimed in Claim 1 in which the adjustable connection includes a  
70 threaded shaft rotatably mounted in the platform and engaging a corresponding threaded member secured to said other frame member.

3. A device as claimed in Claim 1 or 2 including a hinged extension to the platform,  
75 the hinged extension being lockable in alignment with the platform to extend the surface thereof and being lockable in angular relationship to the surface of the platform to retain the article thereon when the device is in  
80 its trolley mode.

4. A device as claimed in Claim 1, 2 or 3 including control means effective to improve handling of the device in its trolley mode.

5. A device as claimed in Claim 4 in  
85 which the control means includes a brake acting on at least one of the wheels.

6. A device as claimed in Claim 4 in which the control means includes a ratchet device acting on at least one of the wheels  
90 and operative to allow rotation of the wheel in one direction only.

7. A device as claimed in Claim 5 in which the control means also includes a ratchet device acting on at least one of the  
95 wheels and operative to allow rotation of the wheel in one direction only.

8. A device as claimed in any preceding claim in which the platform is arranged to provide a working surface when in a raised  
100 position.

9. A mechanical handling device constructed and arranged to operate substantially as hereinbefore described with reference to the accompanying drawing.

Printed for Her Majesty's Stationery Office  
by Burgess & Son (Abingdon) Ltd.—1981.  
Published at The Patent Office, 25 Southampton Buildings,  
London, WC2A 1AY, from which copies may be obtained.